

WHAT IS CLAIMED:

Sub  
a2 1. An isolated nucleic acid molecule encoding a protein which regulates fruit size and/or cell division in plants.

5 2. An isolated nucleic acid molecule according to claim 1, wherein the nucleic acid molecule is a plant nucleic acid molecule.

10 3. An isolated nucleic acid molecule according to claim 1, wherein the nucleic acid molecule is a *fw2.2* gene.

4. An isolated nucleic acid molecule according to claim 1, wherein the nucleic acid molecule encodes a protein which reduces fruit size and/or cell division in plants.

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a3 5. An isolated nucleic acid molecule according to claim 4, wherein the nucleic acid has a nucleotide sequence of SEQ. ID. No. 1.

20 6. An isolated nucleic acid molecule according to claim 4, wherein the nucleic acid molecule encodes a protein having an amino acid sequence of SEQ. ID. No. 2.

25 7. An isolated nucleic acid molecule according to claim 4, wherein the nucleic acid molecule hybridizes to a nucleic acid molecule having a nucleotide sequence of SEQ. ID. No. 1 under stringent conditions characterized by a hybridization buffer comprising 0.9M sodium citrate buffer at a temperature of 45°C.

30 8. An isolated nucleic acid molecule according to claim 1, wherein the nucleic acid molecule encodes a protein which increases fruit size and/or cell division in plants.

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10. An isolated nucleic acid molecule according to claim 8,  
5 wherein the nucleic acid molecule encodes a protein having an amino acid  
sequence of SEQ. ID. No. 4.

12. An expression vector comprising a transcriptional and  
15 translational regulatory DNA molecule operably linked to a nucleic acid molecule  
according to claim 1.

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15. A host cell according to claim 14, wherein the cell is  
25 selected from a group consisting of a bacterial cell, a yeast cell, and a plant cell.

16. A host cell according to claim 15, wherein the cell is a plant cell selected from a group consisting of alfalfa, rice, wheat, barley, rye, cotton, sunflower, peanut, corn, potato, sweet potato, bean pea, chicory, lettuce, endive, cabbage, brussel sprout, beet, parsnip, cauliflower, broccoli, turnip, radish, spinach, onion, garlic, eggplant, pepper, celery, carrot, squash, pumpkin, zucchini, cucumber, apple, pear, melon, citrus, strawberry, grape, raspberry, pineapple, soybean, tobacco, tomato, sorghum, and sugarcane.

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23. A transgenic plant according to claim 22, wherein the plant is selected from a group consisting of alfalfa, rice, wheat, barley, rye, cotton, sunflower, peanut, corn, potato, sweet potato, bean pea, chicory, lettuce, endive, cabbage, brussel sprout, beet, parsnip, cauliflower, broccoli, turnip, radish,

spinach, onion, garlic, eggplant, pepper, celery, carrot, squash, pumpkin, zucchini, cucumber, apple, pear, melon, citrus, strawberry, grape, raspberry, pineapple, soybean, tobacco, tomato, sorghum, and sugarcane.

- 5 24. A transgenic plant according to claim 22, wherein the plant  
is selected from the group consisting of *Arabidopsis thaliana*, *Saintpaulia*,  
petunia, pelargonium, poinsettia, chrysanthemum, carnation, and zinnia.
- 10 25. A transgenic plant according to claim 22, wherein the  
nucleic acid molecule encodes a protein reducing fruit size and/or cell division in  
plants.
- 15 26. A transgenic plant according to claim 25, wherein the  
nucleic acid molecule either 1) encodes a protein or polypeptide having an amino  
acid sequence of SEQ. ID. No. 2, 2) has a nucleotide sequence of SEQ. ID. No. 1,  
or 3) hybridizes to a nucleic acid molecule having a nucleotide sequence of SEQ.  
ID. No. 1 under stringent conditions characterized by a hybridization buffer  
comprising 0.9M sodium citrate buffer at a temperature of 45°C.
- 20 27. A transgenic plant according to claim 22, wherein the  
nucleic acid molecule encodes a protein increasing fruit size and/or cell division in  
plants.
- 25 28. A transgenic plant according to claim 27, wherein the  
nucleic acid molecule either 1) encodes a protein or polypeptide having an amino  
acid sequence of SEQ. ID. No. 4, 2) has a nucleotide sequence of SEQ. ID. No. 3,  
or 3) hybridizes to a nucleic acid molecule having a nucleotide sequence of SEQ.  
ID. No. 3 under stringent conditions characterized by a hybridization buffer  
comprising 0.9M sodium citrate buffer at a temperature of 45°C.
- 30 29. A transgenic plant seed transformed with the nucleic acid  
molecule according to claim 1.

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42. A method according to claim 41, wherein the nucleic acid molecule either 1) encodes a protein or polypeptide having an amino acid sequence of SEQ. ID. No. 4, 2) has a nucleotide sequence of SEQ. ID. No. 3, or 3)

~~nucleic acid mol  
gent conditions  
of sodium citrate~~

Sub 48  
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characterized by a h  
uffer at a temperatu  
according to claim 4  
increases cell divisi

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